

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

145865

DATE: April 7, 1980

Received

4/10/80

4

SUBJECT: Data Set EDO 486, Chemical Recovery Systems, Inc.

FROM: Curtis Ross, Chief  
Central Regional Laboratory

CR

TO: Sandra S. Gardebring, Director  
Enforcement Division

As requested, I am forwarding the attached report which details the organic analysis of the five samples contained within the subject data set.

Any questions regarding this report should be directed to Dr. Emilio Sturino at 353-8370

Attach.

cc: Eastern District Office

Feb. 5, 1980 Sampling Survey

Analytical Results of  
Data Set EDO 486  
Chemical Recovery Systems, Inc.  
April 4, 1980

By

Sukwha Kim, Ph.D.  
U. S. Environmental Protection Agency  
Region V  
Central Regional Laboratory  
536 South Clark Street  
Chicago, Illinois 60605

Objective

The following five samples were collected from Chemical Recovery Systems, Inc., Elyria, Ohio by Dan Watson, Eastern District Office, on February 5, 1980.

These samples were analyzed quantitatively by GC/MS for all identifiable organic compounds present at analytically significant concentrations.

<u>Sample Number</u>	<u>Description</u>
80EW03S01	Solvent from drum in distilling area
80EW03S02	Spilled liquid near distilling area
80EW03S03	Soil from spill in back of lot
80EW03S04	Soil near still door in back of lot
80EW03S05	Soil from a run off area

## Results

Table 1 shows the broad spectrum of organic compounds such as alkyl benzenes, alkyl naphthalenes, ketones, alcohols, esters and hydrocarbons detected in the samples. Particularly Samples 80EW03S01 and 80EW03S02 were heavily contaminated with toluene, xylenes, and trimethylbenzenes. Concentrations of these compounds ranged from 1300 to 50,000\* ppm. In Sample 80EW03S03, 50 ppm of two trichloroaromatic compounds were detected however specific names of the compounds were not identified.

In PCB's analysis only Sample 80EW03S04 contained a significant amount of Aroclor 1242 (590 ppm).

\*The toluene peak was saturated therefore the concentration of this compound should be over 50,000 ppm.

## Methodology

The organic solvent Sample 80EW03S01 was analyzed by diluting 10 ml of sample to a final volume of 80 ml using methylene chloride and then analyzed by the GC/MS.

Sample 80EW03S02 had two layers. Sodium Sulfate was used to remove water from the sample. After which a 3 ml aliquot was extracted with methylene chloride-hexane. This extract was concentrated over a steam bath and analyzed using GC/MS.

Sediment samples were allowed to dry overnight at room temperature. The following day, a known amount of these samples were extracted continuously for 16 hours with a 50/50 acetone/hexane solution. The extracts were concentrated

### Methodology (continued)

over a steam bath using a Kuderna-Danish concentrator. Clean-up was performed using 20 grams of florisil rinsed with hexane and ether. The samples were eluted through the column with 200 ml of 6% ether in hexane. The solutions were concentrated over a steam bath and analyzed by a GC/MS.

### Quality Control

For quality control purposes, a laboratory blank and a laboratory control spike were analyzed along with the actual samples to check the method performance. None of the compounds found in the samples were detected in the laboratory reagent blank. Acceptable results were obtained for the laboratory control spike.

### Instrumental Conditions

Instrument: Finnigan 1015D GC/MS

Mass Range: 40-500 amu

Integration Time: 4 m sec

Threshold: 4

Electron Energy: 70 ev

Column: 25 m x 0.2 mm SP-2100 fused silica capillary

Linear Velocity: 25 cm/sec

Carrier Gas: Helium

Temperature Program:  $T_1 = 50^{\circ}\text{C}$

$T_2 = 250^{\circ}\text{C}$

Time at  $T_1 = 3.5$  min

Time at  $T_2 = 10$  min

Rate =  $4^{\circ}\text{C/min}$

### Conclusion

Sample 80EWS03S01 was contaminated heavily with toluene (50,000\* ppm) .. xylenes (20,000\* ppm). Sample 80EW03S02 was also contaminated with same matrices but much less extent than Sample 80EW03S01. In this sample the amount detected for toluene and xylenes were 7800 ppm and 3300 ppm respectively.

The total contamination of alkylbenzenes for Samples 80EW03S01 and 80EW03S02 was 73,693\* ppm and 27,976 ppm respectively.

The three soil samples did not exhibit any significant contamination by these compounds however Sample 80EW03S03 contained 730 ppm of tetrachloroethane and 50 ppm of trichloro aromatic compounds. Sample 80EW03S04 contained 590 ppm of Aroclor 1242.

\*The toluene and xylene peaks were saturated therefore the concentration of these compounds should be higher than indicated here also for the total amount of alkyl benzene.

### Participants

Yvonne Flynn, Chemist

Ray Liu, Ph.D., Chemist

### Author of this Report

Sukwha Kim, Ph.D.

Table 1  
Data Set EDO 486 - Chemical Recovery Systems, Inc., Elyria, Ohio

COMPOUNDS DETECTED	SAMPLE NUMBER AND CONCENTRATION (ppm)				
	80EW03 S01	80EW03 S02	80EW03 S03	80EW03 S04	80EW03 S05
toluene	50,000*	7800	54	120	28
ethylbenzene	1300	2300	9.1	50	K0.1
xylene (3 isomers)	20,000*	3300	60	270	28
methylethylbenzene (3 isomers)	410	5100	7.3	45	K0.1
propylbenzene	330	45	K0.1	K0.4	K0.1
isomethylbenzene	1300	6000	10	110	5.0
propenylbenzene	27	120	K0.1	K0.4	K0.1
ethyldimethylbenzene (5 isomers)	130	800	14	130	K0.1
butylbenzene (2 isomers)	73	620	K0.1	K0.4	K0.1
tetramethylbenzene (3 isomers)	42	1400	12	56	2.9
methylpropylbenzene	K1.0	210	K0.1	K0.4	K0.1
ethenyldimethylbenzene	4.9	84	K0.1	9.4	K0.1
diethylbenzene	7.3	140	K0.1	K0.4	K0.1
trimethylethylbenzene	3.0	57	5.8	41	K0.1
naphthalene	7.1	520	48	150	8.7

\* These peaks were saturated.

Table 1  
Data Set EDO 486 - Chemical Recovery Systems, Inc., Elyria, Ohio

COMPOUNDS DETECTED	SAMPLE NUMBER AND CONCENTRATION (ppm)				
	80EW03 S01	80EW03 S02	80EW03 S03	80EW03 S04	80EW03 S05
methylnaphthalene (2 isomers)	3.9	130	34	92	14
dimethylnaphthalene (3 isomers)	K1.0	38	K0.1	110	15
ethylnaphthalene	K1.0	K3.0	K0.1	20	K0.1
trimethylnaphthalene	K1.0	K3.0	3.1	44	3.0
4-methyl-2-pentanone	490	1800	K0.1	320	7.0
5-methylhexanone	K1.0	K3.0	18	K0.4	K0.1
3,5,5-trimethyl-2-cyclohexen-1-one	8.1	95	41	290	K0.1
1-(4-methoxyphenyl)-1-propanone	K1.0	K3.0	7.1	K0.4	K0.1
octane	160	40	K0.1	K0.4	K0.1
tetrachloroethene**	K1.0	77	730	19	19
hexachloroethane **	K1.0	K3.0	6.5	5.7	K0.1
4-hydroxy-4-methyl-2-pentane	K1.0	K3.0	870	K0.4	280
4,4-dimethyl-2-pentene	K1.0	K3.0	K0.1	42	K0.1
ethylcyclohexane	20	K3.0	K0.1	K0.4	K0.1
3-methyl-3-ethylhexane	150	280	K0.1	K0.4	K0.1
butoxyethanol	K1.0	K3.0	440	230	16

\*\*Quantitated against the response of a hexachloroethane standard and the rest of the compounds were quantitated to the response of a naphthalene standard.



Table 1  
Data Set EDO 486 - Chemical Recovery Systems, Inc., Elyria, Ohio

ENDS DETECTED	SAMPLE NUMBER AND CONCENTRATION (ppm)				
	80EW03 S01	80EW03 S02	80EW03 S03	80EW03 S04	80EW03 S05
biphenyl-2-ol	K1.0	K3.0	K0.1	46	K0.1
phenylmethylphenol	K1.0	K3.0	K0.1	4.5	K0.1
2,6-bis(1,1-dimethylethyl-4-methylphenol	K1.0	K3.0	6.3	K0.4	K0.1
2-ethoxy-ethanol acetate	170	K3.0	39	K0.4	K0.1
4- [[trimethylsilyl)-oxy]-benzoic acid, methylester	K1.0	K3.0	K0.1	44	16
methylethylcyclohexane	K1.0	38	K0.1	K0.4	K0.1
trichloro-aromatic compound(2)	K1.0	K3.0	50	K0.4	K0.1
Aroclor 1242	K1.0	K3.0	K0.1	590	K0.1
Hydrocarbons	No. of compounds	3	17	12	10
	Concentration	K1.0	307	640	72